Installation Manual

AI-DEQ-01-x

Digital Equalizer / Audio Processor

Document # 540023

AUDIO INTERNATIONAL® INC.

a DeCrane Aircraft Company

7300 Industry Drive, North Little Rock, AR 72117
Phone: 501-955-2929 Fax: 501-955-2988
www.audiointl.com

Document Revision History

Rev. Level	Date	Description
IR	11/1997	Initial Release
A	04/2000	ECN # 4889
B	02/2002	Updated D-sub connector information, added photo

Reference Documents

Document #	Description
523620 Rev IR1	Outline, AI-DEQ-01-x

Service Bulletin List

Service Bulletin #	Subject	Manual Revision	Revision Date

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Model # AI-DEQ-01-x

Digital Equalizer / Audio Processor

1.0 General Information

1.1 Introduction

This manual contains information for the proper installation of the Audio International, Inc. (AI) Digital Equalizer / Audio Processor, Model Number AI-DEQ-01-x. The "-x" suffix in the model number designates the type of connector utilized; "-1" = Positronic and "-2" = D-Subminiature. Also included are the physical and electrical characteristics of the unit.

1.2 Purpose of the Equipment

Audio International's AI-DEQ-01-x is a professional digital equalizer / audio processor. The equalizer provides the passengers the ability to select up to eight (8) programmed music styles. The unit is built to rugged aircraft standards and is easily incorporated into new or existing cabin audio systems.

1.3 Optional Equipment

Audio International, Inc. offers a comprehensive family of Cabin Control Modules. These modules provide convenient solutions for a variety of frequently encountered interfacing needs or special requirements and are an important part of AI's "building block" system for configuring total cabin management.

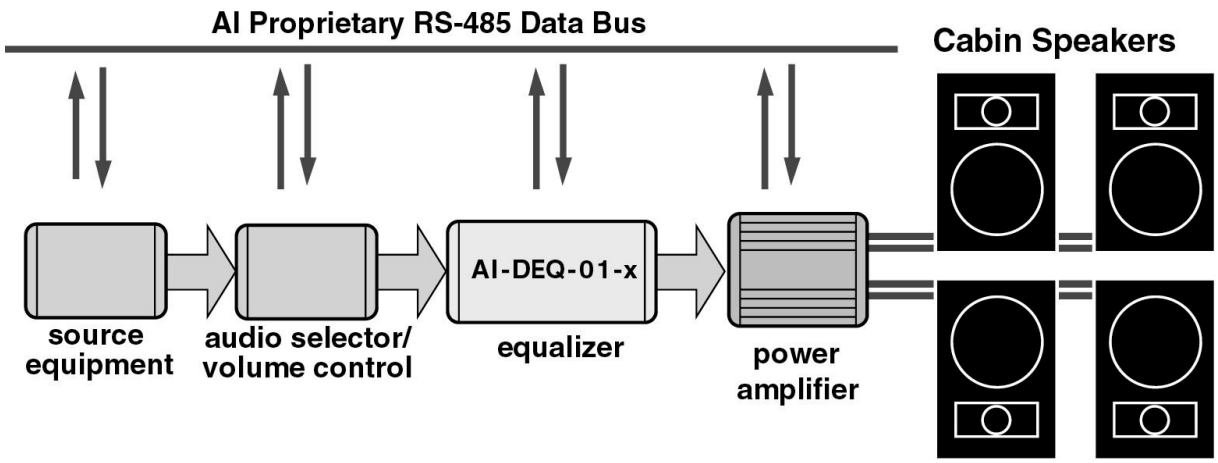
Contact your AI representative for details.

2.0 Application

2.1 Introduction

The purpose of the audio equalizer is to compensate for the frequencies that might be absorbed by the aircraft interior. The equalizer adjustments are most effective when made after the aircraft interior is thoroughly furnished and all pieces of furniture are in place. The AI-DEQ-01-x audio equalizer also tunes to preferred music styles. Through passenger controls, the AI-DEQ-01-x can select the programmed music style.

2.2 Block Diagram – Typical Application



3.0 Installation

3.1 Prior to Installation

3.1.1 During the design and layout of the aircraft cabin, careful consideration of the location of this module is necessary. Some of the items to be considered include:

- Space
- Proximity to other devices (i.e. source equipment)
- Available power supply
- Length of cable runs
- Environmental conditions (temperature, humidity, etc.)
- Location of other aircraft systems (i.e. oxygen delivery)
- Access for service repair (if applicable)

3.1.2 The AI-DEQ-01-x shall be installed to conform to the standards designated by the customer, installing agency, and existing conditions as to the unit location and type of installation.

3.1.3 Mounting screws are required to secure the unit. Refer to Section 7.0, Reference Drawings, for mounting hole diameters and configuration.

3.2 Unpacking and Inspection

3.2.1 Carefully open the packaging and remove the unit. Verify that all components have been included in the package per the packing list. Inspect the unit for damage. Retain the packing materials and packing list.

3.2.2 If damage has occurred during shipping, a claim must be filed with AI within 24 hours and a **Return Request Authorization Number** must be obtained from AI. Refer to the front cover of this manual for address and telephone number of Audio International. Repackage the unit in its original packaging materials and return it to AI following instructions given by the AI representative. If no return is necessary, retain the packing materials for storage or reshipment if necessary.

3.3 *Cautions and Warnings*

3.3.1 It is important to do a pin-to-pin power and ground check on all connectors. Ensure that power and ground are applied only where specified. Damage to the unit may result if power or ground is applied to the wrong points.

3.3.2 **DO NOT** connect or disconnect the module while power is applied.

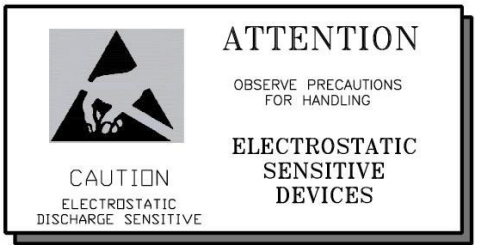
3.3.3 **DO NOT** remove any factory-installed screws. Damage to the unit may result and void any warranties.

3.3.4 **DO NOT** install near heat sources such as direct sunlight, warm air exhausts, or heaters.

3.3.5 **NO** scheduled maintenance is required to ensure continued airworthiness.

3.3.6 The AI-DEQ-01-x shall be located away from heat sources, magnetic fields, direct sunlight, and areas with excessive dust. The unit **SHALL NOT** be mounted to the skin of the aircraft.

3.3.7 **ESD** (Electro Static Discharge) guidelines shall be followed.



3.4 Wiring Requirements

3.4.1 Introduction

The installing agency shall supply and fabricate all external cables and mating connectors. The length and routing of external cables must be carefully studied and planned before attempting installation of the equipment. Allow adequate space for installation of cable and connectors. Avoid sharp bends and placing cables near aircraft control cables. Maintain a MINIMUM clearance of three (3) inches from any control cable. If wiring is run parallel to combustible fluid or oxygen lines, maintain a separation of six (6) inches between the lines.

3.4.2 Power Wires

All power and ground wires shall be 22 AWG, MINIMUM, shielded twisted pair with the shield properly bonded at one end only. Power ground wires shall be bonded to electrically conductive chassis mounting point with <1 Ω resistance or <50 Ω impedance. Protect power wires with circuit breakers or fuses located close to the electrical power source bus.

3.4.3 Audio Lines

All audio input and output cables shall be 22 AWG twisted shielded pair in accordance with the standard military specification of **MIL-DTL-27500** or equivalent unless otherwise specified. All audio input and output lines require twisted shielded cable with the cable shields grounded at the source.

3.4.4 Data Bus Lines

The AI-DEQ-01-x is designed to interface with other Audio International equipment via AI's proprietary RS-485 serial data bus. The data bus is to be implemented using a twisted shielded pair cable in accordance with **MIL-DTL-27500** or equivalent. The wire size for the conductors in this cable shall be 22 AWG, MINIMUM. Shield pins are available for connecting data bus shields when required. In the event shield pins are not provided, the data bus shield must be terminated per AI's RS-485 specification. All equipment on the RS-485 data bus shall be connected in a "daisy-chain" configuration.

AI's proprietary RS-485 serial data bus specification is available upon request.

3.4.5 Device ID Pins

Device ID pins (Pins 14 – 17) are used to provide a unique address on the RS-485 data bus. The ID pins will allow up to seven (7) modules to be installed on the aircraft RS-485 data bus. Since the first ID number is 0, device ID pin connections are not required when only one (1) unit is used. If more than one (1) unit is configured on the data bus, connect the respective device ID pins to ID common.

3.5 Physical Characteristics

3.5.1 Refer to Section 5.0 for unit dimensions.

3.5.2 Refer to Section 6.0 for attachment points.

3.5.3 When mounting the unit, allow sufficient space for mating connectors.

3.6 Electrical Characteristics

3.6.1 Refer to Section 5.0 for electrical specifications.

3.6.2 One (1) 25-pin connector is located on the unit. This connector provides +28 VDC power, audio connections, ground, data bus signals, and ID strapping pins.

3.7 Mating Connector Information

All wiring harnesses to the unit shall be supplied and fabricated by the installing agency.

AI-DEQ-01-1 Connector Description	
RD25F10JVL0	Mating Connector

AI-DEQ-01-2 Connector Description	
DBMA-25S	Mating Connector
DB24659	Backshell
D20419-18	Male Screwlock

3.8 Pinout Assignment Descriptions

Pin 1	
Pin #	**Description**
1	+28 VDC Power Input
2	Ground
3	R+ Audio Input
4	R- Audio Input
5	L+ Audio Input
6	L- Audio Input
7	R+ Audio Output
8	R- Audio Output
9	L+ Audio Output
10	L- Audio Output
11	Data Bus A (HI)
12	Data Bus B (LO)
13	Data Bus Shield
14	Unit ID 0
15	Unit ID 1
16	Unit ID 2
17	Unit ID Common
18	Reserved
19	Reserved
20	Reserved
21	Reserved
22	Reserved
23	Reserved
24	Reserved
25	Reserved

3.9 Post-Installation Test

Load the audio source with selected material. Any unit that relays audio outputs through the AI-DEQ-01-x may be used to test proper operation. With the aircraft and audio power “ON”, apply power to the unit.

Verify that audio input is available to the system. Verify that the selected material may be heard.

4.0 Troubleshooting Guide

4.1 Many problems can be isolated with the following general techniques:

- To verify power to the unit, ensure that +28 VDC is applied to the proper pins. Use a voltmeter to verify correct level.
- Reset by removing power from the unit for at least one (1) minute and then reapply power.
- Recheck all connections to the unit for security. Check all harness runs for possible pinching. Recheck all pinouts for application accuracy.

4.2 Troubleshooting Guide

Problem	Possible Cause	Solution
No sound in speakers	➢ Power amplifier may not be functioning	• Verify +28 VDC power and audio input is present
	➢ Unit is improperly installed	• Uninstall, then properly reinstall unit
	➢ No audio material in source unit	• Insert audio material in source unit
Poor audio quality	➢ Audio controls are not adjusted properly	• Adjust audio controls
	➢ Improper shield terminations	• Verify all shield terminations

Should difficulties arise in the installation of the unit, contact Audio International, Inc. product support.

5.0 Specifications

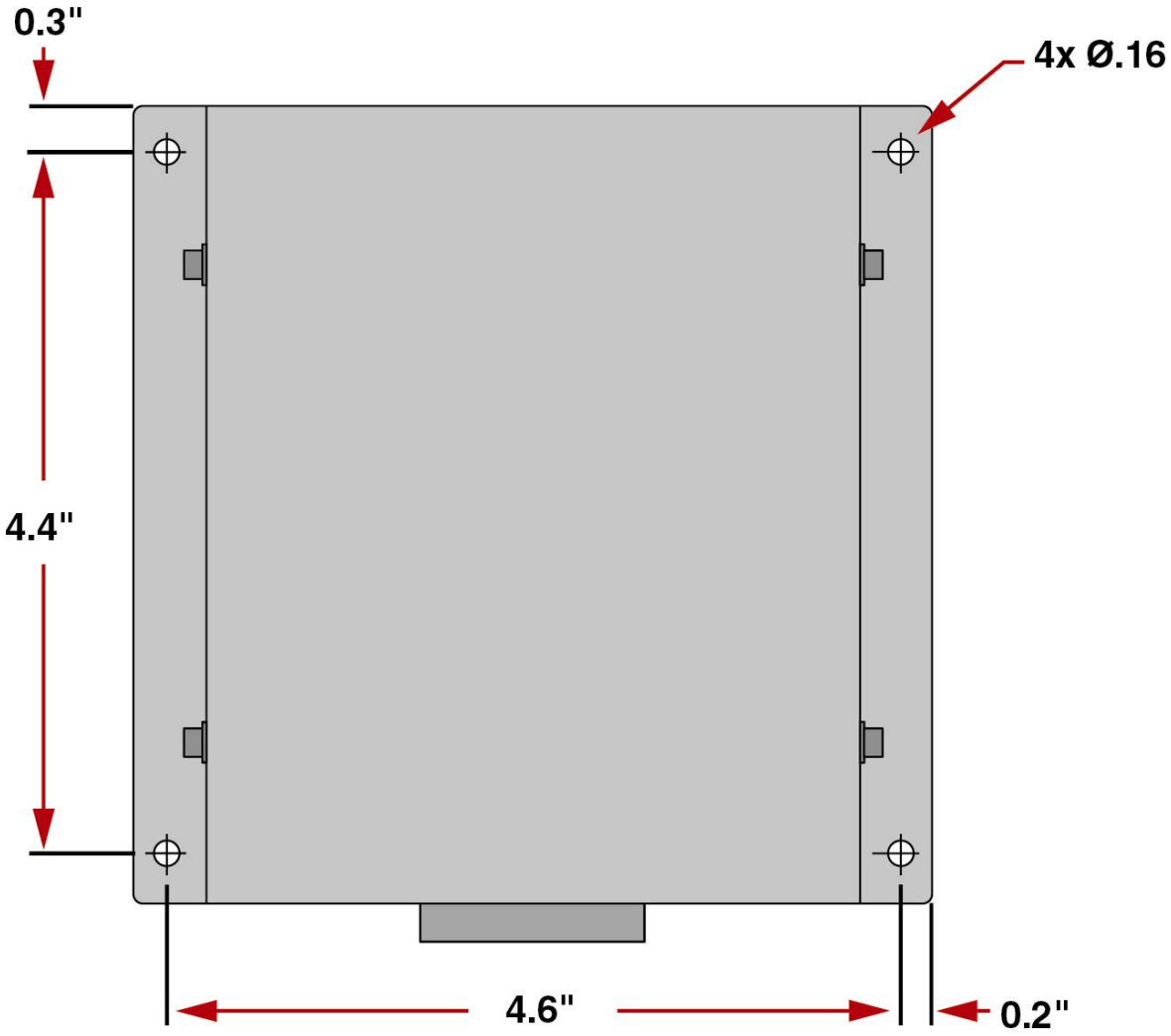
Unit Specifications:

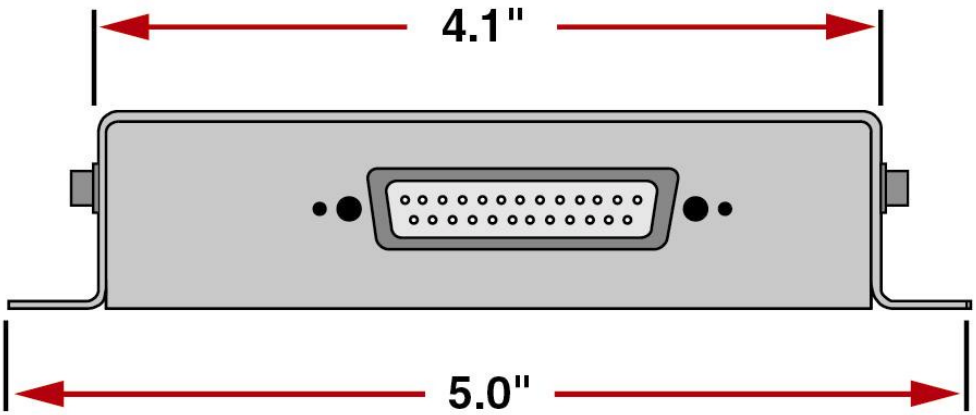
Physical Specifications	
Housing	Aluminum
Weight	0.55 lb / 0.24 kg
Dimensions (l x w x h)	5.0" x 5.0" x 1.1" 13 cm x 13 cm x 2.8 cm

Electrical	Power	150 mA @ +28 VDC
	Output Level Adjustments	0 through 50 dB
	Frequency Bands	31, 62, 125, 250, 500, 1k, 2k, 4k, 8k, 16k
	Data Bus Type	AI Proprietary RS-485 Data Bus

6.0 Reference Drawings

The following diagrams show the unit dimensions and connector locations for the AI-DEQ-01-x.

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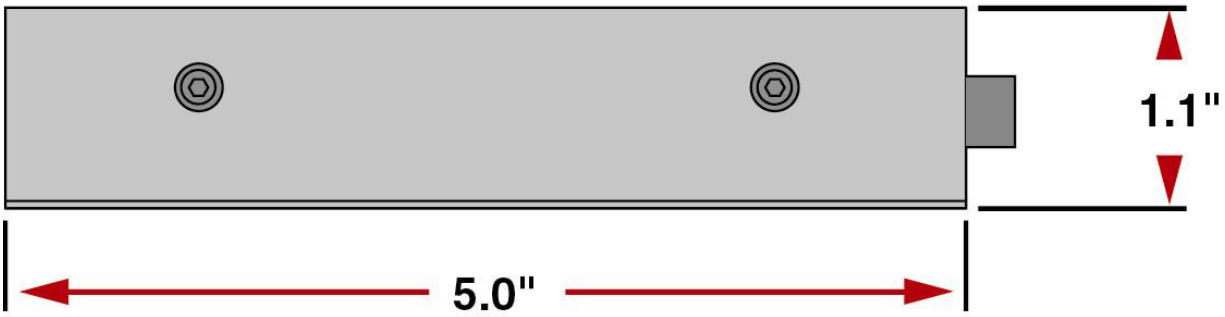
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